TIMES April 27, 1939.

Lose Strange Twin To Dinosaur Fish

LONDON—The strangest true fish story in history, just unfolded in South Africa, has developed one oddly conventional twist—the big one got away.

Scientists of three continents are all egog over the catch, near the port of East London, on the southeast coast of South Africa, of a big blue fish belonging to a family supposed to have become extinct 50,000,000 years ago. In the British science journal, Nature, published here, Dr. J. L. B. Smith of Rhodes University College, describes the five-foot, blue-scaled, archaic-styled monster. And he adds:

"After careful inspection of the mounted specimen, a responsible citizen-angler of East London stated that about five years ago he had found precisely such a fish, only considerably larger, partially decomposed, cast up by the waves on a lonely part of the shore east of East London. When he returned with assistance, the monster had vanished with a risen tide." The big one had got away.

However, Dr. Smith draws some comfort from the fact that a second fish of the same kind has been seen, even if not kept. Deep-sea trawling might conceivably bring in more specimens. The one now in the East London Museum was brought up with a haul of other fish from a depth of 240 feet, but it is considered likely that its actual habitat is deeper than that, and that it had wandered upward.

One argument for its belonging to deep water is found in the great size of its eyes. Fish from considerable depths are likely either to have very large eyes, to catch what few scraps of light there may be, or else to give up the struggle altogether and get along eyeless and blind in the dark.

It is a great disappointment to scientists that owing to inadequate facilities for preservation in East London the flash and internal organs of the "dinosaur-age" fish could not be kept. Spoilage was so rapid that the carcass had to be disposed of, and only a few small parts were kept, apart from the skin which was mounted by the East London Museum taxidermist.

Dr. Smith has given the strange fish the scientific name Latimeria Chalumnae. The first or generic name is a scholarly bow to Miss Courtenay Latimer, curator of the East London Museum, who was the first scientist to examine it. The

A FIN ROMANCE

Fantastic tale's not just any old fish story

By HALLIE LEVINE

IT MAY be just a fish, but nations have fought over it, multimillion-dollar expeditions have been launched in search of it, and submarines have been hand-built to find it.

Now, in the wake of an international best seller about it, Hollywood is gearing up to make the movie.

No, this is not another Jaws, Moby Dick or even (Free) Willy.

All this fuss is for the coelacanth — pronounced see-la-kanth — a rather strange, steel-blue, 5-foot-long fish that swims in the Indian and Pacific oceans.

You can't eat it because it will give you really bad diarrhea. But if you catch one, it's good for you — you're worth a fortune. On the other hand, the fish — used to cold temperatures — dies almost immediately.

So, just what is it about the coelacanth that's hooking all this attention?

"I think there is just something totally fascinating about it," gushes Samantha Weinberg, a British writer whose book about the hunt for the coelacanth, "A Fish Caught in Time" (HarperCollins), has become an international best seller. It hits U.S. bookshelves next month.

The fish is 400 million years old — older than the dinosaurs. It was believed to be extinct until 60 years ago, when it was rediscovered in the net of an unsuspecting fisherman off the South African coast.

Amazingly, it's also our great uncle 40 million times removed [illegible] Scaly, limb-like fins indi-

SEA-ING IS BELIEVING: A diver swims with a coelacanth (pronounced see-la-kanth), a 400-million-year-old fish that was fascinating folks back in 1939, when London's Eastern Province Herald ran this headline (top inset), and that today is the darling of the publishing and movie industries. HarperCollins

million years, separate from all [illegible] Fast there are Marjorie [illegible]

international aquariums eager to find a coela-

first fish to crawl from the sea and evolve onto a reptile. In fact, there's even one at the American Museum of Natural History.

"There is definitely something very wonderful about a creature that has quietly existed for 400 [illegible] the turmoil going on above it on land," says Susan Jewett, an ichthyologist (fish expert) at the Smithsonian Institution.

One thing is clear: Everyone who researches this fish becomes obsessed by it.

HOOKED: Samantha Weinberg, author of "A Fish Caught in Time," calls the coelacanth "totally fascinating." Mark Fletcher

Courtenay-Latimer, curator of a small South African museum, who spotted the strange-looking creature in a local fisherman's net just before Christmas 1938.

Courtenay-Latimer called in J.L.B. Smith, a South African fish expert. He ran a poster campaign along the East African coast, promising a fortune to the fisherman who found a living coelacanth.

When word got out in 1952 that one had turned up in the Comoro Islands — a series of French-governed islands off of East Africa — Smith persuaded the South African government to fly him out to inspect it.

He sparked an international outrage when he whisked the critter off to a Cape Town museum — prompting the French to ban all other scientists from the islands.

When the Comoros became independent and lifted the ban in 1975, German scientist Hans Fricke led the new coelacanth charge. He was so determined to find a live specimen that, in 1989, he built a special submarine to go deep into uncharted waters.

He never caught a live coelacanth, but got many of them on film, recording the nighttime browsing of the fish as they searched for food.

Researchers suspected that less than 300 coelacanths remained in the Comoros, and Fricke spearheaded efforts to save the fish.

listed as endangered by the Convention on International Trade in Endangered Species.

Then, an American scientist recently discovered the fish had other stomping grounds besides the east coast of Africa.

The scientist, Mark Erdmann, was on honeymoon in Indonesia in 1997 when he spotted a large fish being wheeled along on a hand cart. He recognized it immediately as a coelacanth.

Erdmann soon began interviewing fishermen on the Indonesian island about the fish. On July 31, 1998, a fisherman brought him to a live coelacanth.

"The moment I looked at it, I felt this amazing bond with it," recalls Weinberg, who flew to Indonesia after Erdmann's discovery.

"It had this smooth skin and these amazing, shimmering, opaque eyes. When I stroked it, some of the scales fell off in my hand — I still carry them around with me in a sunglass case."

Soon after, camera crews and

But Erdmann worked tirelessly to safeguard the fish — convincing the natives to make money selling coelacanth souvenirs, instead of trying to catch the fish.

Despite the hubbub surrounding the weird-looking fish, it's not on the treasured-creatures list of the woman who "discovered" it.

"I've been pestered and pestered about that coelacanth," grumbled 92-year-old Marjorie Courtenay-Latimer when contacted by The Post.

"I've been in existence for almost as long as that fish, and I'm just tired of people calling me up when I'm practically in bed to comment on it," she said.

Before hanging up, she added grumpily: "The coelacanth. The coelacanth. Enough of the coelacanth!"

> ***"The moment I looked at [the coelacanth] I felt this amazing bond with it. It had this smooth skin and these amazing, shimmering, opaque eyes."***
>
> SAMANTHA WEINBERG, AUTHOR

KNOW WE'D SHOT HIM'

DORISMOND COPS: OUR STORY

Rare 'living fossil' fish found near Indonesia

BERKELEY, Calif. — A biologist has found a second population of a rare, primitive fish whose origins date to the dinosaur era.

The so-called "living fossil" known as a coelacanth was found in July in waters off Indonesia. The only other place the fish are known to exist is in a small area around the Comoros Islands off the coast of Africa.

That discovery, made in 1938, ignited worldwide interest because it disproved theories that the species became extinct about 65 million years ago.

"Indonesia is so far from the Comoros that this must really be another population of the animals," Dr. Sante Paablo, a molecular biologist at the University of Munich, said in Thursday's *New York Times*.

The coelacanth are generally about 5 feet long with paddlelike tails and can weigh more than 60 pounds.

The July find was reported Thursday in the journal *Nature* with a brief letter by the discoverer, Mark Erdmann, a University of California, Berkeley postdoctoral fellow. (AP)

25 SEPT, 98 ARF. DEMO, GAZ.

SCIENCE MUSINGS/CHET RAYMO

Let us consider now the coelacanth

"Consider now the Coelacanth,
Our only living fossil,
Persistent as the amaranth,
And status quo apostle."

Leave it to Ogden Nash, that master of whimsical verse, to find the perfect rhyme for coelacanth. The amaranth is the flower of poetic fame that never fades. And the coelacanth (pronounced see-la-canth) is the fish that never fades. Once thought to have been extinct for eons, it was all the while holing up in the depths of the Indian Ocean, quietly maintaining its unique and amaranthine status quo.

For years the coelacanth was known to science only as a fossil in very ancient rocks. It is a member of a lobe-finned family of fishes that flourished at the time when fins and gills were evolving into feet and lungs. Some of the coelacanthic tribe flip-flopped onto the shore, took a gulp of air, and eventually transformed themselves into the higher animals, including ourselves.

Other coelacanths stayed in the sea and became extinct. The last of their kind show up as fossils in rocks that are 70 million years old.

Or so it was thought.

Then, in 1938, a fisherman snared a coelacanth in the waters of the Indian Ocean off the coast of Africa. This unattractive, mucus-covered, bug-eyed beast, who may have been our ancestor, is not extinct after all. It has maintained itself essentially unchanged in the murky depths of the sea. It is a "fossil"

from the past, mysteriously but most assuredly alive.

Upon discovery, the coelacanth became an instant celebrity, but apparently it has no taste for the limelight. A second specimen was not recovered until 1952. The fish has remained grandly elusive. It may instinctively know that the only way to survive for 70 million years is to lie low and keep out of trouble. After all, look what happened to the coelacanth's terrestrial neighbor, the dodo of Madagascar. Discovered by Europeans in 1507, it was gone a few centuries later. Fame was the dodo's fatal misfortune.

In spite of (or perhaps because of) its natural reticence, the coelacanth has been relentlessly pursued. The first observations of a living coelacanth were reported in 1955 by Jacques Millot, the director of the Madagascar Institute of Scientific Research. Millot's coelacanth was caught on a line and released alive into a tank. The bottom-loving creature with phosphorescent eyes was much distressed to find itself in sunlight. It sought out the darkest corners of the tank. Within hours it had turned belly-up and was making agonized movements with its gill-covers and fins. Its death throes were carefully observed by a crowd of enthusiastic admirers.

The coelacanth was first photographed in its natural habitat by the French diver Jacques Stevens in 1966. Stevens encountered a coelacanth 130 feet under the sea, and set off his flash-gun right into the startled fish's gaping eyes. The highly unflattering color photo soon appeared as a two-page spread in Life magazine. Said Stevens: "Although fierce-looking, my coelacanth was not agressive; it just seemed anxious to escape."

And no wonder. In a recent issue of Nature comes a report of extensive observations of coelacanths at home on the bottom of the sea. A group of German scientists tracked the fish to its lair, 300 feet under the surface, using a research submarine equipped with movie cameras. The site was near the remote volcanic islands of the Comores in the Western Indian Ocean.

On their own "turf," the coelacanths lead a low-key lifestyle that is well-suited to a creature that has been out of touch with progress for 70 million years. It drifts up, and drifts down, on rising and falling currents. It lolls, it dawdles. It sluggishly swims, sometimes forward, sometimes backward, sometimes upside-down. It stands yoga-like on its head, for no apparent reason at all. Only four times in 496 minutes of observations did the Germans record anything resembling a fast start.

Give the last word on the coelacanth to Ogden Nash:

"It jeers at fish unfossilized
Intellectual snobs elite;
Old Coelacanth, so unrevised
It doesn't know it's obsolete."

Chet Raymo is a professor of physics at Stonehill College and author of several books on science.

Living Fossil

Glimpses of a coelacanth

For years, British Cameraman Peter Scoones has had an unlikely dream. A dedicated scuba diver, he wanted to photograph a live coelacanth (pronounced *seal*-ah-kanth), the ancient, almost legendary, stump-legged fish which once was believed to have died out soon after the dinosaurs. Now this *paparazzo* of the deep has nailed his prey. Last week Scoones released rare color photographs of one of these "living fossils," swimming intentedly for his camera in the Indian Ocean off the Comoro Islands near the Malagasy Republic.

On assignment for the BBC, Scoones aided his search by dragging an underwater television camera along the seabed at depths of about 300 meters (1,000 ft.) off the Comoros. On board his small boat, he intently watched the TV monitor for a glimpse of the fish that had only been known from the earth's fossil record until the accidental discovery of a living specimen by a British biologist some 40 years ago. Since then, fishermen have caught two dozen more live coelacanths in their nets. Unfortunately, the creatures, which grow to about 1.5 meters (5 ft.), weigh about 70 kg (150 lbs.) and possess four large fins—apparently the evolutionary beginnings of limbs—usually were dead by the time they reached scientists.

Scoones was not even as lucky as the fishermen. A week into the hunt, the cable to his camera snagged and broke, the equipment was lost, and his frustrated TV crew promptly returned to England. Only a few days later a volcano erupted on Great Comoro. With lava flowing toward the sea, frantic natives commandeered Scoones' boat as an emergency vessel.

Next morning, a disappointed and weary Scoones was shaken out of bed by an excited islander. A full-grown coelacanth had been caught, he was told. It was still alive, lashed under a fisherman's canoe. With only a mask and snorkel, Scoones ventured underwater to free his battle-fatigued quarry, then nudged the fish into a current. That was enough to revive the coelacanth for the camera. Pictures taken, Scoones returned the big catch to the natives—for sale, of course, to scientists. ■

Caught by Comoro fishermen, the shy coelacanth makes a live appearance for the camera

CR: LARRY ARNOLD, PSI

Do Scientists Pose a Threat to Rare 'Fossil Fish'?

Hans Fricke of West Germany, who opposes capture, with photo of live coelacanth.

Experts debate the wisdom of capturing a live coelacanth.

By MALCOLM W. BROWNE

The coelacanth, a rare fish that until 1938 was known only through its fossils, has become the target of collecting expeditions that some scientists fear could lead to the fish's extinction.

Apprehension about the survival of the few coelacanths known to exist has been kindled in part by the efforts of at least one aquarium to capture a live coelacanth. The possibility of keeping a coelacanth in an aquarium tank is nearly as intriguing to some naturalists as the dream of caging a live dinosaur.

Experts say that the scientific quest for coelacanths — dead or alive — has created a black market for the fish. The demand is supplied by commercial fishermen who occasionally bring up a coelacanth (pronounced SEE-la-kanth), from the cold, deep water surrounding the island nation of Comoros in the Indian Ocean.

Until 1938, when a fisherman caught the first known living coelacanth, this group of fishes was believed to have died out 50 million years ago. Coelacanths are abundant in the fossil record, but even since 1938, only a few dozen have been caught, all by commercial fishermen.

The traumatized fish have never survived more than a day or two, and their carcasses have been generally frozen and sold by Comoros businessmen to foreign scientists for dissection and study. The official Government bounty offered to fishermen who bring in coelacanths is $300, but scientists say that a lucrative trade in dead coelacanths is also conducted by private Comoran entrepreneurs.

Coelacanths are large predators with formidable teeth and strong jaws. Naturalists can only guess how many of these Mesozoic-era creatures may still exist. It is not even known whether any live outside the small region of the Indian Ocean where all known specimens have been caught.

Like other coelacanths, the fish's fins, unlike those of most other fish, have bones and joints suggestive of primitive legs. Some scientists therefore believe that close relatives of modern coelacanths may have evolved some 350 million years ago into the first land-dwelling amphibians, and thus were ancestral to all land vertebrates, including man. Other scientists, however, believe that lung fish founded the land vertebrate line.

The current scientific interest in coelacanths was prompted in part by a report last September that were

Continued on Page C8

THE NEW YORK TIMES, TUESDAY, MARCH 22, 1988

Are Scientists a Threat to Rare 'Fossil Fish'?

Continued From Page C1

German scientists had used a small submarine to film coelacanths in their natural habitat off the Comoros islands. The German group, led by Dr. Hans Fricke of the Max Planck Institute for Comparative Physiology in Seewiesen, succeeded for the first time in photographing the peculiar movements and feeding habits of the five-foot fish at the bottom of the ocean. Coelacanths sometimes perform headstands or swim upside down as they loll along the ocean floor.

Subsequently, the New York Explorers Club, the New York Aquarium and a consortium of academic institutions organized an effort to capture and transport a live coelacanth to an aquarium, or, failing that, to acquire dead specimens for dissection. The organizers published an invitation to volunteers willing to pay $4,000 in costs to join a coelacanth expedition.

A nine-member delegation, including two paying volunteers, went to the Comoros last November in search of coelacanths. The group caught no live animals but acquired two frozen specimens from sources that scientists declined to identify. A weeklong post-mortem examination of the two fish was conducted in January at the Virginia Institute of Marine Science by about 30 scientists from 10 universities.

Clarifying Role in Evolution

From computed tomography (CT) scans, microphotographs of tissue cells and analysis of DNA collected in the post-mortem, the team hopes to clarify the role the coelacanth may have played in the evolution of land animals.

Louis E. Garibaldi, acting director of the New York Aquarium and a leader of the campaign to capture a coelacanth, said in an interview that his group had established a network of contacts among fishermen and others in the Comoros, so that if a coelacanth was captured alive it could be protected and swiftly moved to an aquarium.

Dr. Fricke, whose submarine Geo conducted the filming of the coelacanth, strongly opposes the initiative.

"It's outrageous," he said in an interview. "In the first place, I don't believe it is possible to keep one of these animals alive in captivity, after the trauma it undergoes being caught at a great depth, being rapidly depressurized and then being exposed to warm surface water that disrupts its mechanism for absorbing oxygen."

"More important," he added, "if a coelacanth ever should reach an aquarium alive, other aquariums will try to get their own specimens, and these fish are not numerous enough to survive the toll that would be taken. Already we see the Comoro fishermen responding to the economic incentives scientists have created. They are changing their techniques, consciously trying to catch more coelacanths, along with their regular catches. For one thing, they're using much heavier lines than in the past, to hold the big coelacanths when they hook them."

Dr. Fricke said he easily could have captured coelacanths and maintained them under pressure in his own submarine.

"We discovered how to attract these animals by passing a weak electric current through the water outside the submarine," he said. The coelacanth, in common with sharks and some other marine predators, apparently finds and tracks prey by sensing the faint electrical signals emitted by fish.

Decision Against Capture

"Of the six coelacanths we studied, we could easily have taken one aboard," Dr. Fricke said. "But I decided not to do it, because it would have led to more problems for these animals. Later I conferred with the director of the Wilhelma Aquarium in Stuttgart, one of our backers, who had naturally been eager to get a coelacanth. But despite that, he absolutely supported my decision not to bring one back."

Looking for Adventure, Excitement, Discovery? Join Expedition Seeking Ancient Coelacanth

Headline of notice recruiting volunteers willing to pay to join an expedition to capture a coelacanth.

Hans Fricke, who opposes such expeditions, and an assistant, photographing dead coelacanths.

Breeding coelacanths in captivity might help save the species, some assert.

In response, Mr. Garibaldi contended that his group was merely seeking to save some of the coelacanths that are hooked by fishermen and that would otherwise be eaten.

"We are just as interested as Dr. Fricke in safeguarding the coelacanths," he said. "He is entitled to his opinion that these animals cannot be kept alive in captivity, but we believe otherwise. Many animals that are extremely sensitive to changes in habitat have been kept alive."

Having coelacanths living in captivity would not only permit scientists to study the fish and its role in evolution, Mr. Garibaldi said, but might also help to save the species. He said coelacanths might be facing extinction, and suggested that breeding the fish in an aquarium might stave off the end.

"Moreover, as Dr. Fricke has pointed out," he said, "the German group has the means to capture one safely. We have the means to transport it safely. I would welcome cooperation with Dr. Fricke's group."

Dr. Fricke, who vehemently rejects the idea, plans another submarine photographic expedition to the coelacanth's domain in June, supported in part by the National Geographic Society. Meanwhile, he is pursuing another line of research based on clues found in 19th century Spanish churches.

"Some of these churches contain silver votive artifacts in the form of fishes," he said. "The curious thing about these fishes is that they are clearly representations of coelacanths — but not the Latimeria chalumnae coelacanths we find off the Comoros. These works of art are carefully detailed and I am convinced they depict a completely different type of coelacanth, one perhaps smaller than Latimeria, that might have lived until recently in the Atlantic or Mediterranean. The question, of course, is whether any might still be alive."

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22 March 1988 N.Y. Times
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Do Scientists Pose a Threat to Rare 'Fossil Fish'?

N.Y. Times 22 March 1968

Hans Fricke, West German scientist, with photograph of live coelacanth.

Experts debate the wisdom of capturing a live coelacanth.

By MALCOLM W. BROWNE

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Until 1938, when a fisherman caught the first known living coelacanth, this group of fishes was believed to have died out 90 million years ago. Coelacanths are abundant in the fossil record, but even since 1938, only a few dozen have been caught, all by commercial fishermen.

The traumatized fish have never survived more than a day or two, and their carcasses have been generally frozen and sold by Comoros businessmen to foreign scientists for dissection and study. The official Government bounty offered to fishermen who bring in coelacanths is $200, but scientists say that a lucrative trade in dead coelacanths is also conducted by private Comoran entrepreneurs.

Coelacanths are large predators with formidable teeth and strong jaws. Naturalists can only guess how many of these Mesozoic-era creatures may still exist. It is not even known whether any live outside the small region of the Indian Ocean where all known specimens have been caught.

Four of the coelacanth's fins, unlike those of most other fish, have bones and joints suggestive of primitive legs. Some scientists therefore believe that close relatives of modern coelacanths may have evolved some 350 million years ago into the first land-dwelling amphibians, and thus were ancestral to all land vertebrates, including man. Other scien-

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in the New York group. Page A22 | Continued on Page A17, Column 1 | Continued on Page A22, Column 1

Photos of Rare Fish May Be Clue to Evolution

By MALCOLM W. BROWNE

Primitive fish once believed to have died out long before the demise of the dinosaurs have been photographed in their deep ocean habitat for the first time.

The strange movements of these coelacanths, survivors of a biologically ancient line, surprised and delighted the scientists who ventured into their habitat in a research submarine. Scientists believe that analysis of the pictures may shed light on the aquatic ancestry of all land vertebrates, including humans.

The pictures, which include still photographs, movies and videotape, were taken by a West German team using a miniature submarine in the western Indian Ocean near the Comoros Islands. They show the bizarre, five-foot creatures performing occasional headstands, swimming belly up and sometimes swimming backward, among other unusual behavior.

Beginnings of Legs

Dr. Hans Fricke and his colleagues from the Max-Planck Institute for Comparative Physiology and the University of the Saarland recorded the peculiar swimming and maneuvering of six of the animals in eight hours of observations. The findings are reported in this week's issue of Nature, a British scientific journal.

Coelacanths are members of a larger group of primitive fishes, crossopterigians, which many zoologists believe are an important evolutionary link between aquatic and terrestrial vertebrates. Of the eight fins on these fish, four are paired and have bone structures that may represent the beginning of a transition to the legs of

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A coelacanth, about 5 feet long, photographed in Indian Ocean.

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Ms. Magazine Is Sold

An agreement in principle has been reached to sell the feminist monthly to John Fairfax Ltd., the Australian publisher. Page D1.

Prices Up In New York Area

The Consumer Price Index for New York and northeastern New Jersey soared in August at nearly twice the national rate. Page D1.

N.F.L. Talks Resume

Negotiators for National Football League owners and the striking players met in Philadelphia in an effort to settle the walkout. Page B7.

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First Deep-Sea Photos of Rare Fish May Be Clue to Evolution

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land animals. The extinct rhipidistian fishes, also members of the crossopterygian line and close cousins of coelacanths, are widely regarded as ancestors of the amphibians, from which all other four-footed land animals are believed to have evolved.

Fossils of crossopterigians have long been known to paleontologists. Judging from the fossil record, coelacantha and other crossopterigians first appeared in the Devonian period 350 million years ago, and they evolved into an extremely successful line. The coelacantha' formidable teeth made them effective predators. But the fossil record suggested that crossopterigians became extinct around 90 million years ago, some 25 million years before the disappearance of dinosaurs.

Strange Catch Off Africa

In 1938, however, a fisherman near the southern coast of Africa netted a strange fish, the remains of which reached a biologist. He identified the animal as a coelacanth.

The discovery was a sensation, and scientists offered rewards to fishermen for more "living fossils," as the creatures were dubbed. In 1952 a second specimen turned up, and since then, a few more coelacanths have been found in the Indian Ocean, some of which were captured alive.

But despite many efforts, scientists have never succeeded in fully reviving the traumatized coelacanths brought up hundreds of feet to the surface, and live specimens have always died within a day or two of capture. This has prevented paleontologists and anatomists from studying the natural movements of healthy coelacanths. Such observations were regarded as important in finding possible traces of the animals' preadaptation to crawling on land.

The New York Times/Sept. 24, 1987

Primitive fish were photographed near the Comoros Islands.

Despite the extreme rarity of living coelacanths, Dr. Fricke's group says in its Nature report that the scientists found no fewer than six of the fish at depths from 380 to 600 feet. Although they proved to be nocturnal, the animals did not seem disturbed by the bright lights of the manned submarine Geo.

Puzzling Movements

The behavior of the fish was sometimes puzzling. All the coelacanths occasionally performed a kind of head lasting up to two minutes. Sometimes they swam with their bellies up, sometimes they swam backwards.

For the most part, the fish maneuvered sluggishly, merely coasting in the upwelling or downwelling of ocean currents. Occasionally they would dart forward, their main thrust coming from their large, paddle-like tail fins.

But of greatest interest to the scientists was the peculiar synchronous pattern of movements of the creatures' paired fins that was likened to the movements of four-legged animals. This pattern, they said, "is common to tetrapod locomotion," but is extremely rare in fish, other than in a few bottom-dwelling species.

Two coelacanths were observed resting on the ocean bottom, and they did not use their paired fins to crawl. But the synchronous movements of these limb-like fins seemed to help stabilize the cigar-shaped bodies of the fish. "Such coordination," they suggested, "could indicate another preadaptation in the crossopterygian group that could have facilitated the transition to locomotion on land."

The evolutionary role of the crossopterigians remains a subject of debate, to which the film produced by the German expedition is likely to add fuel.

Possible Evidence of Link

Dr. John G. Maisey, associate curator of vertebrate paleontology at the American Museum of Natural History in New York, believes the German film may offer important new evidence.

The coelacanths photographed by the expedition "are very similar to extinct lines of crossopterigians, and their movements may therefore reveal evolutionary clues," he said. "The manner in which they open and shut their mouths, use their gills, pass water over their pharyxaes and so forth, can tell us a great deal about their evolutionary relationship to land-dwelling tetrapods. Vertebrate paleontologists are most anxious to see this film."

Dr. Maisey noted that crossopterigians are not the only candidate as precursors of land vertebrates. The lungfish, which can absorb oxygen from the air as well as from water, is also a possibility.

"Many would say that the lungfish are closer to land tetrapods," he said, "although there are far more crossopterigians in the fossil record. The crossopterigians reached their high point at the end of the Triassic period," 195 million years ago, "and then declined sharply."

"By the Cretaceous period," he said, referring to the heyday of the dinosaurs, which ended 65 million years ago, "the crossopterigians were already very much reduced in numbers."

Dr. Gary Nelson, curator of ichthyology at the same museum, believes the German expedition may have opened a new line of inquiry. "These coelacanths," he said, "were found at much shallower depths than had been regarded as normal for the animal. The investigators actually saw six of them during their observations. This suggests that living coelacanths may be more plentiful and accessible than anyone had suspected. We may even see a coelacanth in an aquarium one day."

Dr. Maisey believes it is possible that other supposedly extinct animals may have survived in remote ocean habitats. "I'm not speaking of the Loch Ness monster or of claimed sightings of living plesiosaurs," he said, "but somewhere, there may have survived a handful of supposedly extinct species of great interest to science. Surprises are still possible."

Other points of view on the Op-Ed page seven days a week. The New York Times

fish, four are paired and have bone structures that may represent the beginning of a transition to the legs of

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ces Up In New York Area

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Are Scientists a Threat to Rare 'Fossil Fish'?

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tists, however, believe that lung fish founded the land vertebrate line.

German Film Expedition

The current scientific interest in coelacanths was prompted in part by a report last September that West German scientists had used a small submarine to film coelacanths in their natural habitat off the Comoros islands. The German group, led by Dr. Hans Fricke of the Max Planck Institute for Comparative Physiology in Seewiesen, succeeded for the first time in photographing the peculiar movements and feeding habits of the five-foot fish at the bottom of the ocean. Coelacanths sometimes perform headstands or swim upside down as they loll along the ocean floor.

Subsequently, the New York Explorers Club, the New York Aquarium and a consortium of academic institutions organized an effort to capture and transport a live coelacanth to an aquarium, or, failing that, to acquire dead specimens for dissection. The organizers published an invitation to volunteers willing to pay $4,000 in costs to join a coelacanth expedition.

A nine-member delegation, including two paying volunteers, went to the Comoros last November in search of coelacanths. The group caught no live animals but acquired two frozen specimens from sources that scientists declined to identify. A weeklong post-mortem examination of the two fish was conducted in January at the Virginia Institute of Marine Science by about 30 scientists from 10 universities.

Clarifying Role in Evolution

From computed tomography (CT) scans, microphotographs of tissue cells and analysis of DNA collected in the post-mortem, the team hopes to clarify the role the coelacanth may have played in the evolution of land animals.

Louis E. Garibaldi, acting director of the New York Aquarium and a leader of the campaign to capture a coelacanth, said in an interview that his group had established a network of contacts among fishermen and others in the Comoros, so that if a coelacanth was captured alive it

Looking for Adventure, Excitement, Discovery? Join Expedition Seeking Ancient Coelacanth

The International Angler

Headline of notice recruiting volunteers willing to pay to join an expedition to capture a coelacanth.

Hans Fricke, who opposes such expeditions, and an assistant, photographing dead coelacanths.

Already we see the Comoro fishermen responding to the economic incentives scientists have created. They are changing their techniques, consciously trying to catch more coelacanths, along with their regular catches. For one thing, they're using much heavier lines than in the past, to hold the big coelacanths when they hook them."

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Dr. Fricke, who vehemently rejects the idea, plans another submarine-photographic expedition to the coelacanth's domain in June, supported in part by the National Geographic Society. Meanwhile, he is pursuing another line of research based on clues found in 19th century Spanish churches.

"Some of these churches contain

Do Scientists Pose a Threat to Rare 'Fossil Fish'?

Hans Fricke of West Germany, who opposes capture, with photo of live coelacanth.

Experts debate the wisdom of capturing a live coelacanth.

By MALCOLM W. BROWNE

THE coelacanth, a rare fish that until 1938 was known only through its fossils, has become the target of collecting expeditions that some scientists fear could lead to the fish's extinction.

Apprehension about the survival of the few coelacanths known to exist has been kindled in part by the efforts of at least one aquarium to capture a live coelacanth. The possibility of keeping a coelacanth in an aquarium tank is nearly as intriguing to some naturalists as the dream of caging a live dinosaur.

Experts say that the scientific quest for coelacanths — dead or alive — has created a black market for the fish. The demand is supplied by commercial fishermen who occasionally bring up a coelacanth (pronounced SEE-la-kanth) from the cold, deep water surrounding the island nation of Comoros in the Indian Ocean.

Until 1938, when a fisherman caught the first known living coelacanth, this group of fishes was believed to have died out 90 million years ago. Coelacanths are abundant in the fossil record, but even since 1938, only a few dozen have been caught, all by commercial fishermen.

The traumatized fish have never survived more than a day or two, and their carcasses have been generally frozen and sold by Comoros businessmen to foreign scientists for dissection and study. The official Government bounty offered to fishermen who bring in coelacanths is $200, but scientists say that a lucrative trade in dead coelacanths is also conducted by private Comoran entrepreneurs.

Coelacanths are large predators with formidable teeth and strong jaws. Naturalists can only guess how many of these Mesozoic-era creatures may still exist. It is not even known whether any live outside the small region of the Indian Ocean where all known specimens have been caught.

Four of the coelacanth's fins, unlike those of most other fish, have bones and joints suggestive of primitive legs. Some scientists therefore believe that close relatives of modern coelacanths may have evolved some 350 million years ago into the first land-dwelling amphibians, and thus were ancestral to all land vertebrates, including man. Other scientists, however, believe that lung fish founded the land vertebrate line.

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Are Scientists a Threat to Rare 'Fossil Fish'?

Continued From Page C1

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Lmmt E. Garibaldi, acting director of the New York Aquarium and a leader of the campaign to capture a coelacanth, said in an interview that his group had established a network of contacts among fishermen and others in the Comoros, so that if a coelacanth was captured alive it could be protected and swiftly moved to an aquarium.

Dr. Fricke, whose submarine Geo conducted the filming of the coelacanth, strongly opposes the initiative.

"It's outrageous," he said in an interview. "In the first place, I don't believe it is possible to keep one of these animals alive in captivity, after the trauma it undergoes being caught at a great depth, being rapidly depressurized and then being exposed to warm surface water that disrupts its mechanism for absorbing oxygen."

"More important," he added, "if a coelacanth ever should reach an aquarium alive, other aquariums will try to get their own specimens, and these fish are not numerous enough to survive the toll that would be taken. Already we see the Comoro fishermen responding to the economic incentives scientists have created. They are changing their techniques, consciously trying to catch more coelacanths, along with their regular catches. For one thing, they're using much heavier lines than in the past, to hold the big coelacanths when they hook them."

Dr. Fricke said he easily could have captured coelacanths and maintained them under pressure in his own submarine.

"We discovered how to attract these animals by passing a weak electric current through the water outside the submarine," he said. The coelacanth, in common with sharks and some other marine predators, apparently finds and tracks prey by sensing the faint electrical signals emitted by fish.

Decision Against Capture

"Of the six coelacanths we studied, we could easily have taken one on board," Dr. Fricke said. "But I decided not to do it, because it would have led to more problems for these animals. Later I conferred with the director of the Wilhelma Aquarium in Stuttgart, one of our backers, who had naturally been eager to get a coelacanth. But despite that, he absolutely supported my decision not to bring one back."

Looking for Adventure, Excitement, Discovery? Join Expedition Seeking Ancient Coelacanth

Headline of notice recruiting volunteers willing to pay to join an expedition to capture a coelacanth.

Hans Fricke, who opposes such expeditions, and an assistant, photographing dead coelacanths.

Breeding coelacanths in captivity might help save the species, some assert.

In response, Mr. Garibaldi contended that his group was merely seeking to save some of the coelacanths that are hooked by fishermen and that would otherwise be eaten.

"We are just as interested as Dr. Fricke in safeguarding the coelacanths," he said. "He is entitled to his opinion that these animals cannot be kept alive in captivity, but we believe otherwise. Many animals that are extremely sensitive to changes in habitat have been kept alive."

Having coelacanths living in captivity would not only permit scientists to study the fish and its role in evolution, Mr. Garibaldi said, but might also help to save the species. He said coelacanths might be facing extinction, and suggested that breeding the fish in an aquarium might stave off the end.

"Moreover, as Dr. Fricke has pointed out," he said, "the German group has the means to capture one safely. We have the means to transport it safely. I would welcome cooperation with Dr. Fricke's group."

Dr. Fricke, who vehemently rejects the idea, plans another submarine photographic expedition to the coelacanth's domain in June, supported in part by the National Geographic Society. Meanwhile, he is pursuing another line of research based on clues found in 18th century Spanish churches.

"Some of these churches contain silver votive artifacts in the form of fishes," he said. "The curious thing about these fishes is that they are clearly representations of coelacanths — but not the Latimeria chalumnae coelacanths we find off the Comoros. These works of art are carefully detailed and I am convinced they depict a completely different type of coelacanth, one perhaps smaller than Latimeria, that might have lived until recently in the Atlantic or Mediterranean. The question, of course, is whether any might still be alive."

ANTHONY LEWIS
Sundays and Thursdays on the Op-Ed page

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SPECIAL FOR THIS WEEK

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Hantsmbou Journal

It's No Fish Story: There's a Dinosaur Down There

By SUZANNE DALEY

HANTSMBOU, Comoros — In this tiny fishing village, a place where the black lava rock coastline gives way to a small stretch of white sandy beach, Otsamba Chindini is something of a celebrity.

Three years ago, in his 27th year as a fisherman, he caught one of the world's rarest fish — a 157-pound coelacanth, a fish with leglike fins that scientists call a living fossil.

The species was assumed to have become extinct with the dinosaur about 70 million years ago. Then in 1938, one was hauled up in a net off the coast of South Africa.

Since then, fewer than 200 have been caught — virtually all of them in the deep waters off Grande Comore island and off Anjouan, a neighboring island in the Comoran archipelago. Some scientists estimate that there may be no more than 500 coelacanths (pronounced SEE-luh-kanths) still in existence.

Part of Mr. Chindini's celebrity certainly comes from the catch — no one else in his village has caught one of the five-foot-long metallic blue fish with white spots.

But the other part of his fame, judging from the grins of his fellow fishermen, is that he did not recognize that he had a coelacanth and bludgeoned it to death. Mr. Chindini, who lives with his wife and seven children in a one-room house shaded by palm trees, grins about this too.

But he is willing to tell the story: how, as he was hoping for tuna or oilfish, he sandwiched the bait between two stones so it would sink far below the surface, and how because of a special loop he could release the stones with a small flick of the wrist, leaving the white bait exposed to catch any glimmer of light to be

Pictures by John Moore/Agence, for The New York Times

The coelacanth, above, a primitive fish once thought to have become extinct with the dinosaur 70 million years ago, is occasionally caught in the deep waters off the Comoros Islands in the Indian Ocean by fishermen using dugout canoes. Otsamba Chindini, top left, of Hantsmbou, a tiny village on Grande Comore Island, hooked one three years ago and, unaware of its value, smashed its head in. Some scientists estimate that there may be no more than 500 coelacanths still in existence.

found 840 yards below the surface, and how suddenly his line was very heavy.

"I pulled very carefully," Mr. Chindini said, pantomiming the motions. He does not mind showing off the line he used either. It looks like a large ball of knitting wool. Fishing is strictly by hand here.

At first Mr. Chindini was simply disappointed by his catch. But when he got back to the village, and learned its value, he wished he had not been so quick to bash in its skull.

Still, he got $217 for it from the former director of the island's fishing institute — a fortune for Mr. Chindini, who like most of the other fishermen on this remote Indian Ocean island barely ekes out a living.

The truth is, no coelacanth are living in captivity. They are slow-moving creatures that live at great depths. They absorb oxygen badly and there is less in the warm surface water than down at the depths where they live, so the fight to the surface, and the rapid decompression, leaves them so drained that they usually die in a day or two.

In 1938, the discovery of the coelacanth sent fish experts aflutter. Some believed that the modern coelacanth is a close relative of the line of fishes that gave rise to the first vertebrates to walk on land.

Fossils show that the fish once existed in great abundance.

But the fishermen of the Comoros mostly consider the coelacanth a nuisance. They are not particularly good to eat. They have value only when foreigners come around asking. In 1994, the Comoran Government signed an international treaty agreeing not to trade in coelacanths. But there are no laws against landing them and there is a black market.

In the past, aquariums have come asking too. A Japanese aquarium came looking a few years ago, handing out free synthetic lines, which the fisherman around here most appreciated. The New York Aquarium wanted one too.

But in both cases, they met with strong opposition from coelacanth experts and backed off. Many of the experts believe that if one aquarium manages to capture and show off "old four legs," as the fish is affectionately called, others will want one too — and the rush to collect the fish might lead to its extinction.

"Even though we believe we could quite easily do it, create a great sensation, and make a lot of money, we are not doing it," said Michael N. Bruton, the director of the Educational Trust at the Two Oceans Aquarium in Cape Town and a leading authority on the fish. "In fact we are campaigning against anyone doing it."

Mr. Bruton supports another idea: putting cameras in the deep sea grottos where coelacanth rest during the day and satelliting the images around the world to aquariums, so that those who were interested could watch the fish's balletic movements. Scientists who have observed the fish from a miniature submarine have found that it actually does not use its leglike fins, but sometimes performs headstands and swims upside down as it lolls along the ocean floor.

Mr. Bruton says such a project would cost about $400,000. This would include creating an information center on this island, so that Comorans, too, might learn to appreciate the coelacanth. But raising money for the project has proved difficult.

"People love the hot and furries," Mr. Bruton said. "But they don't like conserving the wet and slimies. Anyone who has tried to raise money for frog or snake or eel conservation, or fish conservation, or insect conservation has a heck of a job, compared to the fabulous fur balls."

In the meantime, the fisherman of the Comoros ply their trade much as they have for decades, paddling dugout canoes into the temperamental seas around these islands. Depending on the time of year, they venture into deeper waters for large fish or stay close to the clefts, snagging an assortment of fish the size of a child's hand.

Recently, Ishmael Yousouff was shivering in the twilight, his tiny haul at his feet. Mr. Yousouff is a creative fisherman for these parts, leaning over the side of his canoe and using a scuba mask to watch his prey. He is also a cook, but, he said, the French owner of the restaurant where he worked closed up shop and left the country last year without paying him a month's wages.

Mr. Yousouff shrugs off all the interest in the coelacanth, saying he is more concerned with the lack of jobs on the island and the continuing political turmoil.

"For us it is just a fish," Mr. Yousouff said. "It may be interesting for scientists, but not for us."

"You think this is very beautiful," he said, sweeping his arm across the black rocks, the white beaches and the aqua sea. "But for us it is quite ordinary. I would like to see New York."

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3d Priest Is Killed in India

NEW DELHI, Oct. 29 (AP) — A Catholic priest was found beheaded in a forest in northern India, apparently killed for helping untouchables, colleagues said today.

A search party from the Australian-run mission that employed the priest, the Rev. A. T. Thomas, found his body Monday near Sirka, Bihar, three days after he was abducted.

He was the third Catholic clergyman killed in two years in Bihar, where caste-based gang wars have killed hundred of people.

Father Thomas, an Indian, had established 15 schools and health projects for untouchables.

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Program

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Welchmen Catch Fish With Legs

LONDON, June 23 (AP) Two Welsh fishermen have caught a 20-pound fish with two short legs and tiny webbed feet.

The fish was four feet long, the legs 8 inches long and extending from its hind fins. Trevor and David Jones hooked it last night from a row boat in Cardigan Bay. No one there had ever seen anything like it, and Government Fisheries Office officals are going to Abersoch to examine it.

The fish was dark brown with front fins resembling a skate's, a flat head measuring about 9 inches, slit eyes shaped like half-moons, a tall and rear fins like those of a dogfish—and those legs.

Russell Fears Reprisals By Pentagon

Assails McElroy, Cancels Testimony Of Taylor, Pate

By Willard Edwards
Chicago Tribune Press Service

Chairman Richard B. Russell (D-Ga.) of the Senate Armed

Backs B To Give Author

2 Amendme To Tighten NATO Usag

By Patricia
United Press Int

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The measure, w proved by voice stantially would dent Eisenhowe broader authori atomic weapons terial to this co Atlantic Treaty a

Because of changes in the viously appro House, however, will go to a joi committee to th ferences between sions.

Before approv sure, the Senate amendments by P. Anderson (